

ACID BASE AND SALT PART- 2

MENTION THE CHEMICAL NAME AND WHICH ONE IS WEAK AND STRONG ACIDS??

1. **CH₃COOH** - Acetic acid (weak)

2. **HCl** - Hydrochloric acid (strong)

3. **CCl₃COOH** - Trichloro acetic acid (weak)

4. **H₂SO₃** - Sulfurous Acid (weak)

5. **HBr** - Hydrobromic acid (strong)

6. **HI** - Hydroiodic acid (strong)

7. **C₂H₂O₄** - Oxalic acid (weak)

MENTION THE NAME WHICH ONE IS WEAK AND STRONG BASE WITH THEIR CHEMICAL NAME ??

1. **CsOH** - Caesium Hydroxide (Strong)
2. **C₅H₅N** - Pyridine (Weak)
3. **NaOH** - Sodium Hydroxide (Strong)
4. **LiOH** - Lithium Hydroxide (Strong)
5. **H₂S** - Hydrogen sulfide (Weak)
6. **NH₄OH** - Ammonium Hydroxide
7. **RbOH** - Rubidium Hydroxide (Strong)



Acid	Base	Salt	Example
Strong	Strong	<u>Neutral</u>	$\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ <p style="text-align: center;"> <u>SB</u> <u>SA</u> <u>Neutral salt</u> </p>
Strong	<u>Weak</u>	<u>Acidic</u>	$\text{HCl} + \text{NH}_4\text{OH} \rightarrow \text{NH}_4\text{Cl} + \text{H}_2\text{O}$ <p style="text-align: center;"> <u>SA</u> <u>WB</u> <u>Acidic salt</u> </p>
<u>Weak</u>	Strong	<u>Basic</u>	$\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O}$ <p style="text-align: center;"> <u>WA</u> <u>SB</u> <u>Basic salt</u> </p> <p style="text-align: right;">→ Sodium Acetate</p>
Weak	Weak	<u>Neutral</u>	$\text{CH}_3\text{COOH} + \text{NH}_4\text{OH} \rightarrow \text{CH}_3\text{COONH}_4 + \text{H}_2\text{O}$ <p style="text-align: center;"> <u>WA</u> + <u>WB</u> <u>Neutral salt</u> </p> <p style="text-align: right;">Ammonium acetate</p>

Acid + Base = Salt + Water

1. Salts form by the combination of acid and base through neutralization reaction.

2. The acidic and basic nature of salts depends on the acid and base combined in neutralization reaction.

PROPERTIES AND USES OF SALTS

The most common salt is ^{NaCl} sodium chloride or table salt which forms by the combination of sodium hydroxide (base) and hydrochloric acid.



Other examples include Epsom salts (MgSO₄) used in bath salts.

Ammonium nitrate (NH₄NO₃) used as fertilizer,

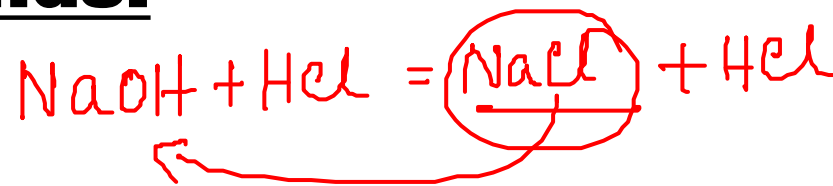
Baking soda (NaHCO₃) used in cooking.

Sodium Bicarbonate
Sodium hydrogen carbonate

➤ Some Important Chemical Compounds:

• Common Salt (NaCl)

Sodium chloride is known as common salt. Its main source is sea water. It is also exists in the form of rocks and is called rock salt. Common salt is an important component of our food. It is also used for preparing sodium hydroxide, baking soda, washing soda etc.



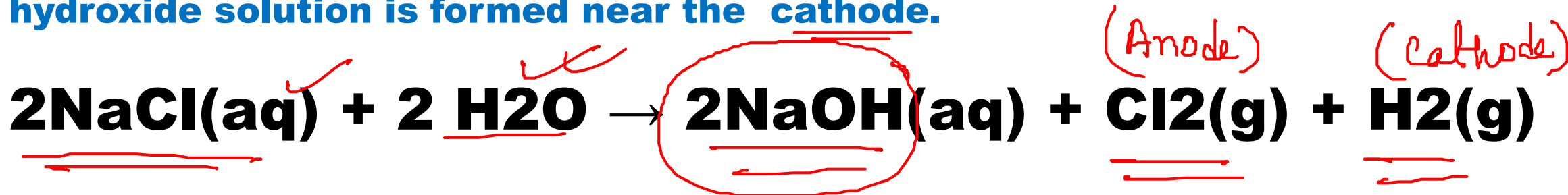
• Sodium hydroxide (NaOH)



Electrolysis

Prepared by Chlor Alkali process : Electricity is passed through an aqueous solution of Sodium chloride. Sodium chloride decomposes to form sodium hydroxide.

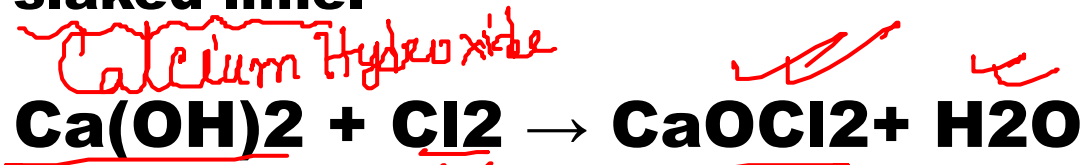
Chlorine gas is formed at the anode, and hydrogen gas at the cathode. Sodium hydroxide solution is formed near the cathode.



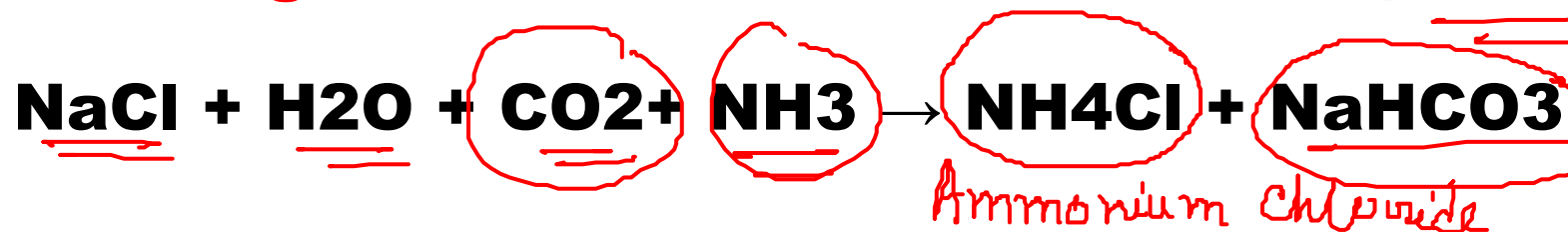
- **Bleaching powder:**



Bleaching powder is represented as CaOCl_2 , though the actual composition is quite complex. Bleaching powder is produced by the action of chlorine on dry slaked lime.



- **Baking soda:** Sodium hydrogen carbonate (NaHCO_3) Preparation:



- **Washing soda:** Sodium carbonate $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ In the first step, sodium carbonate is obtained by heating baking soda.



The colour of some acid - base indicators in acidic and basic medium are given below :

S. No.	Indicators	Colour in acidic medium	Colour in basic medium
1	Litmus solution ✓✓	Red ✓	Blue ✓
2	Methyl Orange ✓✓	Pink ✓	Orange ✓
3	Phenolphthalein ✓✓	Colourless ✓✓	Pink ✓✓
4	Methyl red ✓✓	Yellow ✓✓	Red ✓✓

5. Thymol Blue

Red

Yellow

6. Methyl yellow

Red

Yellow

7. Phenol Red

Yellow

Red

8. Neutral Red

Red

Yellow

9. Nile Blue

Blue

Red

Acid base indicators indicate the presence of an acid or a base by a change in their colour or smell.

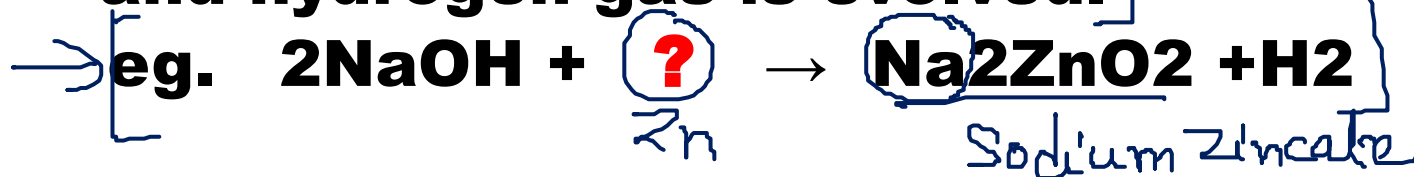
- **Indicators can be natural or synthetic.**
- **Olfactory indicators:** These are those indicators whose odour changes in acidic or basic medium.

Onion : Smell of onion diminishes in a base and remains as it is in an acid.

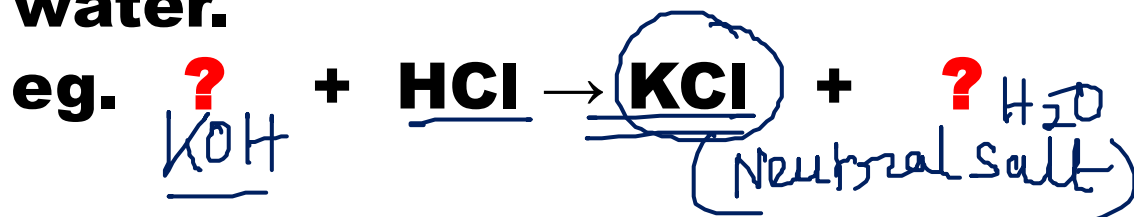
Vanilla : The odour of vanilla essence disappears when it is added to a base. The odour of vanilla essence persists when it is added to an acid.

➤ Chemical properties of Bases: (HW)

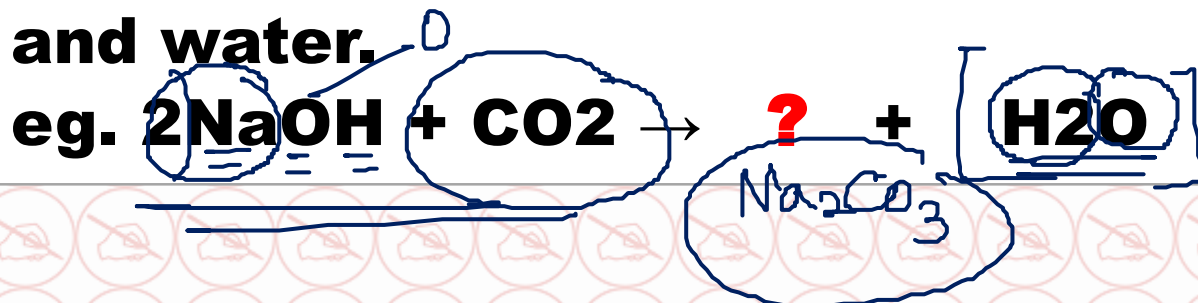
i) **Reaction with Metals** - Certain reactive metals such as Zinc, Aluminium, and Tin react with alkali solutions on heating and hydrogen gas is evolved.



ii) **Reaction with acids** - Bases react with acids to form salt and water.



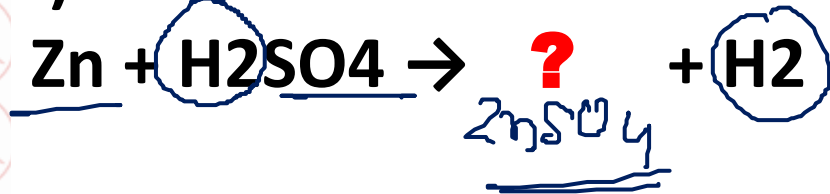
iii) **Reaction with Non-metallic oxides** - These oxides are generally acidic in nature. They react with bases to form salt and water.



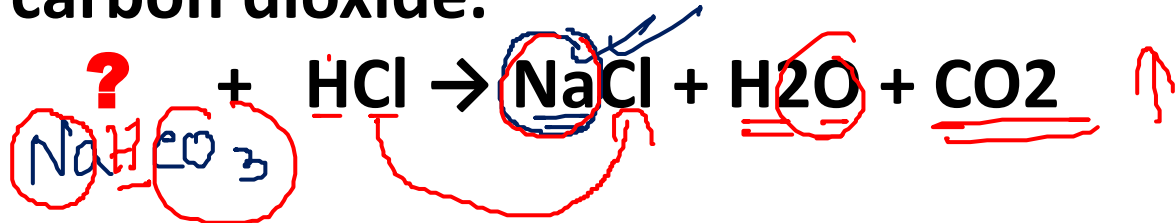
Balance

Chemical properties of acids:

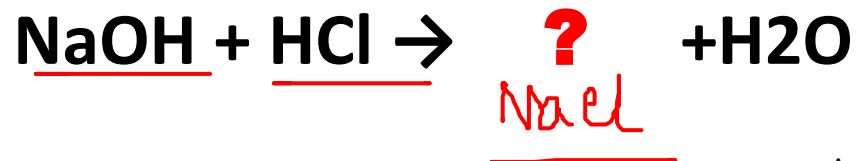
i) Acids react with active metals to give hydrogen gas.



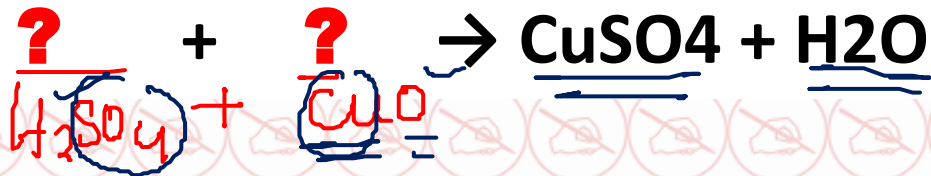
ii) Acids react with metal carbonate or metal hydrogen carbonate to give carbon dioxide.



iii) Acids react with bases to give salt and water. This reaction is called as neutralization reaction.



iv) Acids react with metals oxides to give salt and water.



Thank

you

